CIRM Shared Research Laboratory Information Form – Part Two

Section A. Project Information

Project Title	The Gladstone CIRM Shared Human Embryonic Stem Cell Core Laboratory

Limited to 300 Characters

Project Start Date	July 1, 2007	Construction Start Date	Nov 15, 2007	Occupancy Date	Feb 15, 2008

Total Part Two Funds Requested for Shared Laboratory Space	$1,466,644
Total Part Two Funds Requested for Stem Cell Techniques Course	
Total Capital Funds Requested	$ 840,029

Note: All green fields are calculated values. Do not enter a value in the field.

Please indicate whether you propose to apply for funding of a Stem Cell Techniques Course along with the Shared Laboratory Space, or just the Shared Laboratory Space.

(●) Shared Research Laboratory only ( ) Shared Research Laboratory and Stem Cell Techniques Course

NOTE: Please be aware that any information you provide in this form will be made publically available.

Section A. 1. Program Director

Name	Prefix: Dr.	First: Deepak	Middle:	Last: Srivastava	Suffix:

Email (office)	dsrivastava@gladstone.ucsf.edu	This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.
Application Number	CL1-00514-1	This field should fill automatically, based on the email address. If not, enter the number you received via email from CIRM, in the form "XX9-99999-9", where "X" is a letter, and "9" is a digit.

Section A. 2. Facilities Contact

Name	Prefix: Ms.	First: Deborah	Middle: S.	Last: Addad	Suffix:

Institution	The J. David Gladstone Institutes	If your institution is not listed, please identify the name of the institution here.
Other Institution		
Position Title	Operations Officer	
Department	Administration	
Address	1650 Owens Street	

City	San Francisco			CA	Zip Code 94158
Phone Number	(415) 734-2013	Ext		Fax Number	
Email (office)	daddad@gladstone.ucsf.edu	This email address identifies you to CIRM. Please use this email address for all correspondence with CIRM.			

(Revised 03/07/2007)

Section A. 3. Public Abstract

See Appendix A.

Section A. 4. Statement of Benefit to California

See Appendix A.

Section B. Laboratory Renovation Plan

Project Manager	Deborah Addad		Construction Supervisor	Contractor--To Be Named
Title	Operations Officer		Title	
Company/Institution	Gladstone Institutes		Company/Institution	

Describe plans for development/renovation of the shared laboratory space including fixed equipment costs. Include a description of the current space and how it will be renovated and reconfigured to form the laboratory. Include as attachments one 11x17 page of the current floor plan space and one 11x17 page of proposed floor plan of the renovated space. Describe all renovations that will be done. Describe how the project will be managed and tracked, as well as how change orders will be handled. For laboratories that are proposed to be located in leased space, provide information regarding the institution's long-term access to the leased space. Describe plans and schedule for all phases of development including design, construction, and installation of equipment leading to a functional laboratory. Give a proposed contingency plan in case of cost overruns. Any additional costs due to budget overruns will be the responsibility of the grant recipient. (narrative limited to 3 pages)

In October 2004, The J. David Gladstone Institutes moved into a newly constructed 200,000-square-foot research facility in the heart of Mission Bay. The Gladstone building is adjacent to the expanding University of California, San Francisco (UCSF), Mission Bay Campus and in the heart of the Mission Bay biotech cluster. Alexandria Real Estate Equities, Inc., is opening its first 165,000-square-foot building (1700 Owens St.) next door to Gladstone and preparing to start another research building this summer. The proposed shared facility will represent an important resource, not only to Gladstone and UCSF investigators, but also the growing bioscience community in the Mission Bay area.

Completed in advance of schedule and under budget, the Gladstone building includes offices and cubicles, biochemistry laboratories, auditorium and conference facilities, specialized core laboratories, and an animal care facility (rodents). The first floor houses administration, the second floor was initially shelled, floors 3–5 houses laboratories and offices for each of the three institutes, and the sixth floor is dedicated to the AAALAC-approved animal care facility. The second floor was subsequently renovated and is a biochemistry laboratory with offices similar to floors 3–5. Other unfinished space includes a 668-square-foot specialized procedure area on the fourth floor and 3,600 square feet of animal housing space on the sixth floor. The lab renovation plan is to complete the unfinished fourth floor procedure room to develop a human embryonic stem cell (hESC) laboratory (668 sq ft) and to renovate a small portion of the unfinished sixth floor for a housing and procedure room for in vivo pre-clinical studies of hESC in rodent models of disease (336 sq ft).

Human embryonic shared stem cell lab:
At the time the new building was being planned and constructed, Gladstone was recruiting a new director of our Cardiovascular Institute. We decided to allow the new director to determine the optimal use for this 668 square feet of unfinished space on the fourth floor. Serendipitously, we succeeded in recruiting Dr. Deepak Srivastava, a superb investigator and pediatric cardiologist, who studies the development of the heart. Dr. Srivastava has a major interest in using human stem cells as an approach to his studies. This shared research lab will be used for tissue culture space to grow hESCs and advanced imaging laboratory for visualization of the cells. Directly across from this space is an existing 440 square feet of space dedicated to mouse embryonic stem cell work. The two rooms totaling 1108 square feet will form a single stem cell shared laboratory and will be managed as one unit. These labs will support the stem cell work of 13 Gladstone investigators and numerous Bay Area scientists.

The renovated space will feature 8 tissue culture hood work stations, space for refrigerators, –80°C freezers, refrigerated centrifuge, Coulter counter, and other miscellaneous laboratory equipment. It will also feature an area dedicated to advanced imaging. The area will be screened by blackout curtains and will accommodate two microscopy stations.

Although unfinished, the area has vinyl flooring and finished walls. Renovations will require installation of data ports, utilities (gas, air, vacuum, and house CO2), heating, ventilating, and air conditioning (HVAC) and electrical power. Only one non-bearing wall will have to be moved. While the current mechanical system is sized to meet the demand requirements of the space, mechanical work will require supply and exhaust ductwork, fire dampers, and insulation. Completion of the building management system will require installation of four phoenix valves.

Equipment in this area requested is described in Section B.2. Budget.

Animal housing and procedure room:
The sixth floor animal care facility space is less developed than the fourth floor and will require more renovation. HVAC, electrical

Section B -- 1. Laboratory Renovation Plan (continued)

power and utilities terminate to the area, but there are no finished walls, floors, ceilings, or data connections. To simplify and reduce the cost of renovations, we plan to use only one of four separate unfinished housing areas. Several non-bearing interior walls will be erected for the housing and procedure areas.

Funding for this room is critical. NIH funds from a research facility construction grant were used to assist in completing the facility. A separate area in the barrier facility not supported by NIH funds is essential to house and work with rodents and non-NIH approved human stem cell lines in conjunction with the hESC shared facility on the fourth floor. A housing area of 16 x 21 feet will allow a maximum of 640 cages to house rodents. Adjacent to the housing area will be a procedure room for visualizing living cells within animals by transmission fluorescence, reflectance fluorescence, and bioluminescence imaging. This area is 336 square feet. The Xenogen IVIS Spectrum will be placed in our barrier animal facility adjacent to a VisualSonics optical tomography system and advanced ultrasound optical imaging system recently purchased without NIH funding. These instruments will be managed together: they will be in close physical proximity and will require only a single operator. The imaging systems will be used to image animals before and after minor surgical procedures (e.g., implantation of hESCs). Therefore, we will need space to accommodate housing of the immunodeficient mice, a surgical area, and imaging equipment all in close proximity, without leaving the barrier facility.

Equipment requested in this area is described in Section B.2. Budget.

Project management:
Project management will be overseen by Daniel Oshiro, Vice President for Administrative Affairs, and Deborah Addad, Operations Officer. While at Cedars-Sinai Medical Center, Mr. Oshiro served as the academic liaison in building a 151,000-square-foot research facility in 1991, and a subsequent expansion of an additional 70,000 square feet in 1996. The completed research building finished on budget and on time. Mr. Oshiro was also deeply involved in the construction of the Mission Bay Gladstone building, which was completed in October 2004. Ms. Addad was the key Gladstone staff member representing the owner oversight and serving as liaison to the project team, consisting of the architect, contractor, and project manager. She was also the key Gladstone team member for the project to finish the shelled second floor of our building (26,000 square feet) and a 3,000-square-foot build-out of shell space in the building (1700 Owens Street) next to the Gladstone building. The depth of this recent experience will ensure a successful project that is well designed and on time and on budget. Robert W. Mahley, MD, PhD, who is the president of The J. David Gladstone Institutes, has actively participated in the planning and shares the responsibilities for the successful completion of this project.

The CIRM shared laboratory information form, Part Two, Supplement, details the historical performance in recent construction/ alteration projects. Gladstone has a depth of recent experience and success in completing major construction projects (see Project 1 on the Supplement form), completing a floor of shelled space (see Project 2 on form), and making tenant improvements of shelled space (see Project 3 on form). These projects were successfully completed on time and on budget.

Project plans:
This renovation is a straight-forward project. Existing conditions are well known, and there is a minimal risk of unanticipated field conditions that could escalate construction costs. The project requesting funding from CIRM will be built as a Guaranteed Maximum Price (GMP) with a fixed construction price. It will be managed as a design build team with the architect, contractor, and owner (Deborah Addad, Operations Officer) acting as project manager. The project will be tracked on Microsoft Project by the contractor. The team will meet weekly, or more frequently if needed, to review the schedule, requests for information (RFIs), and change order requests (CORs). Change orders that are a result of owner changes to the design will be the responsibility of Gladstone. Because of the advanced condition of the current shell space, change orders are not likely to result from the design or RFIs. However, the process will be to submit an RFI that the team will review. A rough order of magnitude will be submitted, and the change will be evaluated on cost and necessity. If approved, a COR will be submitted and approved. As a result of experience in construction and renovation and good planning and input from multiple parties, Gladstone has an excellent history of keeping owner initiated changes to a minimum. The phases and time schedule are detailed in Section B.1. Schedule/Timeline and Drawdown of Funds Table. Our prior experience has demonstrated our ability to maintain project schedules and budget management. The most problematic aspect of the schedule is anticipated to be obtaining building permits. However, if required we will use a permit expediter that has proven to be very successful in obtaining permits.

Contingency:
Because of the size of the job, our experience, and the known nature of our building, we do not believe there are many unknown

Section B -- 1. Laboratory Renovation Plan (continued)

or reasons to anticipate any problems. The original project cost for construction of the 200,000-square-foot building in Mission Bay (see Project 1 on the Supplement) was $105,700,000 and the final actual cost was $97,571,000. The contingency of $7,150,000 in the original budget was not used due to Gladstone's money-saving decisions and expertise in construction projects. However, Gladstone has budgeted, in the CIRM request, a 10% contingency. If costs exceed this contingency, Gladstone will commit to covering the additional expenses to complete the work.

Section B. 1. Schedule/Timeline and Drawdown of Funds Table

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)		7/16/07	
2	Request for Planning Funds (10% of Construction Costs)		7/16/07	$ 84,003
3	Prepare Preliminary Plans	7/17/07	8/3/07	
4	Approval of PPs		8/14/07	
5	Prepare Working Drawings	8/15/07	9/13/07	
6	Approval of WDs		9/14/07-9/24/07	
7	Request Construction Contract funds (80% of Construction Costs)		9/24/07	$672,023
8	Advertise for Construction Contract	9/25/07	10/3/07	
9	Award Construction Contract		11/14/07	
10	Construction Activities	11/15/07	2/11/08	
11	Completion of Equipment Purchases		10/3/07	
12	Request Equipment Purchase funds		10/3/07	$146,563
13	Beneficial Occupancy		2/11/08	
14	Notice of Completion		2/11/08	
15	Request Construction Completion Amount (10% of Construction Funding)		2/11/08	$ 84,003

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from which a contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.

Section B. 2. Budget

Provide a complete budget for the renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for movable equipment (equipment requires 20% matching funds). (narrative limited to 3 pages)

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

The renovation budget was based on our recent experience with similar projects in San Francisco and is based on information from experienced construction project estimates. The budget detail are as follows:

Construction contract: $372,672 (hESC core) + $210,450 (animal housing) = $583,122
Other construction cost: $9,091 (hESC core only)
Design fees: $63,453 (hESC core) + $52,209 (animal housing) = $115,662
Administrative costs: $33,743 (hESC core) + $20,283 (animal housing) = $54,026
Construction contingency: $49,112 (hESC core) + $29,016 (animal housing) = $78,128

Total construction cost: $528,071 (hESC core) + $311,958 (animal housing) = $846,029

Movable Equipment Gladstone Purchased:
Optical tomography ($122,817) + Ultasound ($157,235) = Subtotal Moveable Equipment Gladstone Purchased: $280,052

Moveable Equipment-Whittier Foundation:
Microinjection set up: $200,000

Movable Equipment Requested from CIRM:
Thoren cages, 4 racks ($130,396) + Changing station ($16,167) = Subtotal Moveable Equipment Requested from CIRM: $146,563

Total Movable Equipment: $626,615

Four racks of Thoren cages are required in the renovated animal housing room. This will allow the housing of 640 cages of mice. A changing station is also required to change bedding in the rodent cages and to perform simple procedures in the housing area.

Section B. 3. Budget Summary Table

Complete the budget summary for the use of CIRM funds.
Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		**Total Budget**	**CIRM Grant Funds**	**Institutional Match**
Construction Contract Costs		$ 583,122	$ 583,122	
Other Construction Costs (institutional)		$ 9,091	$ 9,091	
Subtotal Construction		$ 592,213	$ 592,213	
Design Fees		$ 115,662	$ 115,662	
Administrative Costs		$ 54,026	$ 54,026	
Construction Contingency		$ 78,128	$ 78,128	
Total Construction		$ 840,029	$ 840,029	
Movable Equipment		$ 626,615	$ 146,563	$ 480,052
Total Budget		$1,466,644	$ 986,592	$ 480,052
Gross Square Feet		$ 0.00	$ 0.00	Const Costs/GSF
Assignable Square Feet		$ 0.00	$ 0.00	Const Costs/ASF

Section B. 4. Institutional Commitment

Provide a detailed description of the amount and source of matching funding for each request that requires matching funds. The requirement of matching funds can be satisfied if the institution can document funds, excluding other grant funds, committed to similar projects (i.e., renovation of lab space and equipment purchase) after January 1, 2005. Detail the use of the space after the three year period is completed. (narrative limited to 2 pages)

The matching funds will come from Gladstone and a grant from the L. K. Whittier Foundation, detailed below:

Ultrasound (Gladstone), purchased 7/2/06, in the amount of $122,817
Optical Tomography (Gladstone), purchased 12/23/05, in the amount of $157,235
Microinjection System and related equipment, to be purchased, in the amount of $200,000

Total cost: $480,052

The Whittier Foundation has awarded a grant to Gladstone for $1,500,000 to support the recruitment of Dr. Shinya Yamanaka. Dr. Yamanaka has officially accepted the position at Gladstone effective 8/1/07. He will be a major user of the hESC shared core laboratory. Dr. Yamanaka will use a portion of the $1,500,000 grant for a dedicated microinjection set up for making transgenic mice. This equipment will be an essential component of the shared core laboratory services. The Gladstone purchases have already been made as noted. Cumulatively, the matching commitment is $480,563 or 49% ($480,000 ÷ 986,592).

Detail of space use after three years.
In three years we anticipate the hESC shared laboratory will be an actively used resource for Gladstone and the UCSF Mission Bay faculty. The three CIRM seed grants, one comprehensive grant, one CIRM training grant, and the recruitment of Dr. Shinya Yamanaka will guarantee increased usage. Both Gladstone and UCSF continue to recruit stem cell scientists which assures the importance of this shared laboratory.

Section C. Stem Cell Techniques Course (if applicable)

Based on the information provided in Part One of the application describing the course, include a justification of the additional space required and additional equipment requested, if any. Include additional square footage and provide as an attachment one 11x17 page of the proposed floor plan of the renovated space. (narrative limited to 1 page)

Limit narrative to visible field area.

Section C. 1. Schedule and Drawdown of Funds Table (if applicable)

Provide a realistic schedule and drawdown of funds for completing each activity/milestone, as indicated below.

#	Activity/Milestone	Start Date	Completion or Milestone Date	Amount of CIRM funds to be drawn
1	Grant Award (estimate)			
2	Request for Planning Funds (10% of Construction Costs)			$ 000
3	Prepare Preliminary Plans			
4	Approval of PPs			
5	Prepare Working Drawings			
6	Approval of WDs			
7	Request Construction Contract funds (80% of Construction Costs)			$ 000
8	Advertise for Construction Contract			
9	Award Construction Contract			
10	Construction Activities			
11	Completion of Additional Equipment Purchases			
12	Request Additional Equipment Purchase funds			
13	Beneficial Occupancy			
14	Notice of Completion			
15	Request Construction Completion Amount (10% of Construction Funding)			$ 000

"Preliminary Plans" (PPs) represent approximately 35 percent of the design effort, or may be considered the product of completing the "Design Development" (DDs) phase of architectural work.

"Working Drawings" (WDs) represent drawings and specifications from whicha contractor may determine the full extent of work contemplated in the project for purposes of submitting a bid; may be referred to as completion of "Construction Documents" (CDs) phase of architectural work.

"Additional Equipment" represents equipment to be used for the Stem Cell Techniques Course.

Section C. 2. Budget (if applicable)

Provide a complete budget for the additional renovation that includes construction costs, design fees, administration of the project, other costs (i.e. installation of equipment) and a construction contingency (limited to 7-10% of the construction budget). Identify the amount of CIRM funds requested and the matching funds (construction requires 20% matching funds). Provide a complete budget for additional movable equipment (equipment requires 20% matching funds). (narrative limited to 3 pages)

(Note: An Excel spreadsheet can be attached as long as the total submission for this Section is limited to 3 pages)

Section C. 3. Budget Summary Table (if applicable)

Complete the budget summary for the use of CIRM funds.
Note: All colored fields contain calculated data. Please do not enter anything in those fields.

Other Project Costs				
Budget Category		**Total Budget**	**CIRM Grant Funds**	**Institutional Match**
Construction Contract Costs				
Other Construction Costs (institutional)				
Subtotal Construction				
Design Fees				
Administrative Costs				
Construction Contingency				
Total Construction				
Additional Movable Equipment				
Total Budget				
Gross Square Feet		$ 0.00	$ 0.00	Const Costs/GSF
Assignable Square Feet		$ 0.00	$ 0.00	Const Costs/ASF

CIRM Shared Research Laboratory Information Form – Part Two

Section D. Signature Page

Complete, save, and print Part Two of the Shared Research Laboratory Grant Information.

Submit electronic application as an email attachment to laboratory@cirm.ca.gov no later than 5:00pm PST on March 16, 2007.

Mail* the original executed Part Two application and five (5) copies to:

Shared Research Laboratory Grant Application
California Institute for Regenerative Medicine
210 King Street
San Francisco, CA 94107

***Mailing must be postmarked no later than March 16, 2007.**
Applications will not be accepted after these deadlines.

Project Start Date	July 1, 2007	Construction Start Date	Nov 15, 2007	Occupancy Date	Feb 15, 2008

Total Part Two Funds Requested for Shared Laboratory Space	$1,466,644
Total Part Two Funds Requested for Stem Cell Techniques Course	
Total Capital Funds Requested	$ 840,029

Facilities Contact

Ms. Deborah S. Addad
Operations Officer
Administration
The J. David Gladstone Institutes
1650 Owens Street
San Francisco, CA 94158
(415) 734-2013
daddad@gladstone.ucsf.edu

Authorized Organizational Official	Date
Print Name	Title
Program Director	Date
Print Name	Title

(Revised 03/07/2007)

CIRM Shared Research Laboratory Information Form – Part Two Supplement

Project Information

Application Number: CL1-00514-1

Program Director Name:

Historical Performance

Provide information on past performance for 3 projects.

	Project 1	Project 2	Project 3
Brief Project Title	Gladstone Mission Bay Rese	Second Floor Completion of	1700 Owens Street Complet
Original Budget (Total project cost)	105,700,000	$6,556,263	$ 000
Final project cost	97,571,000	$6,418,087	$ 000
Scheduled Completion Date	12/04	10/05	3/1/07
Actual Notice of Completion Date	9/8/04	10/05	3/15/07
Gross Square Feet involved	196,000	30,000	2,000
Assignable Square Feet involved	173,182	22,500	2,000
Approximate number of change orders	8	1	2
Value of all change orders & claims	$ 000	$ 000	$ 23,000
Type of construction management	Design Build	Design-Bid-Build	Design Build

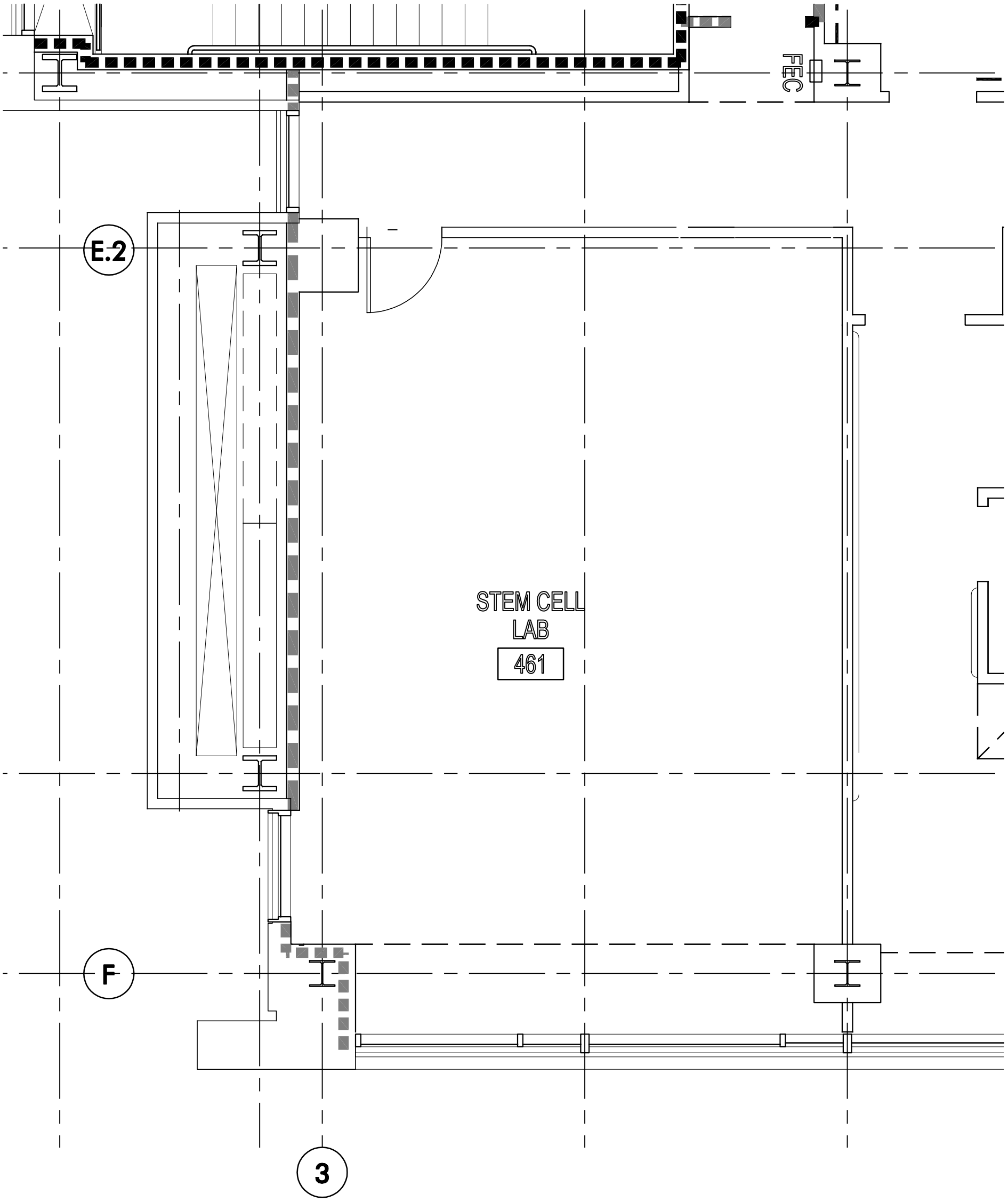
Laboratory Alteration Projects

Please enter the number of laboratory alteration projects completed by the applicant in the past 2 years (in the range of $1-5 million in project cost), and the approximate total dollar value that these projects represent.

Total Laboratory Alteration Projects: 0

Approximate Total Value: $ 000

Limit Budget Justification to visible field area.



DGA planning | architecture | interiors

201 Filbert St., 3rd Floor
San Francisco, CA 94133

415.477.2700
f.415.477.2710

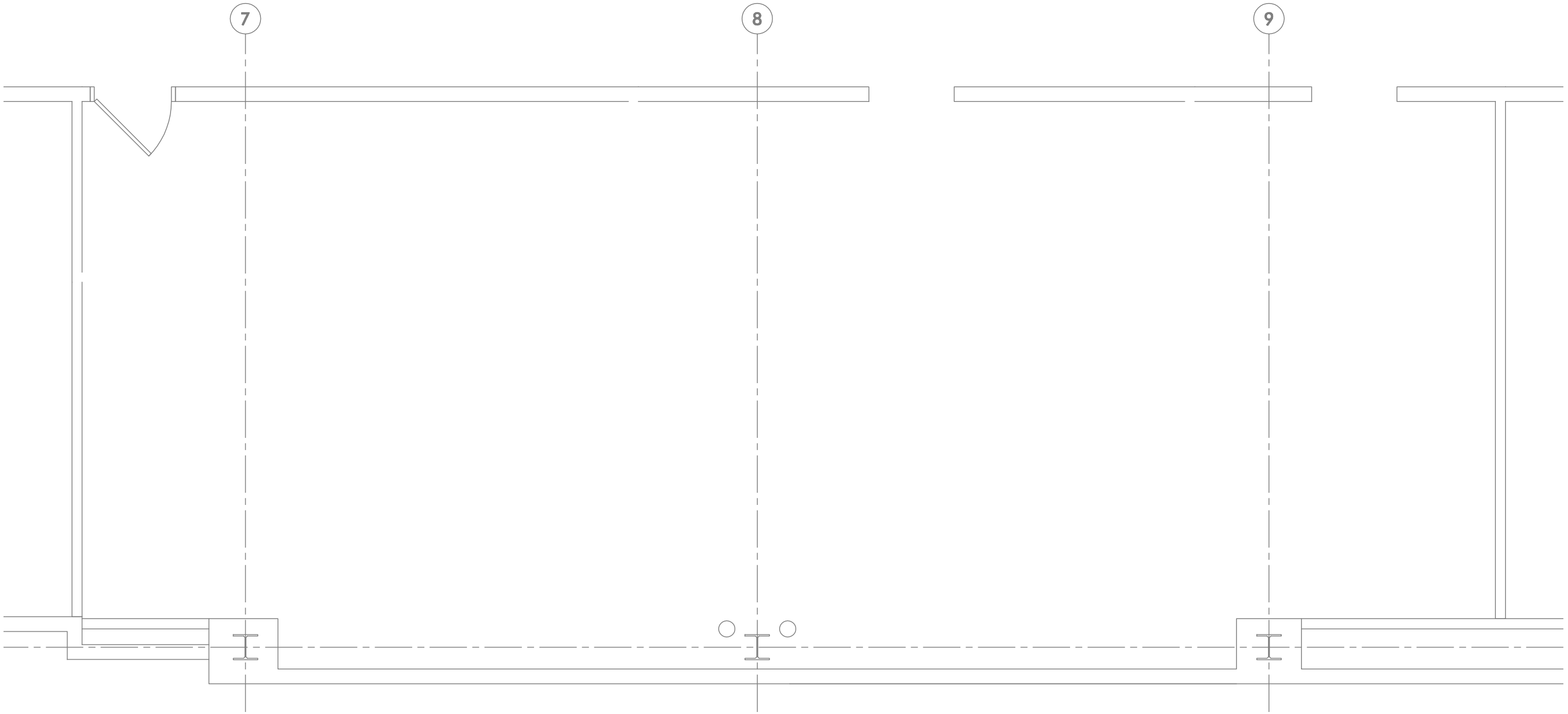
NEW STEM CELL SUITE
4TH FLOOR

Drawing Title:

THE J. DAVID GLADSTONE INSTITUTES AT SAN FRANCISCO MISSION BAY
1650 OWENS STREET, SAN FRANCISCO CA

Project:

Job No:	06XXX
Date:	9 MAR 2007
Ref:	DRAFT
Scale:	1/4" = 1'–0"
Dwg. No:	SK 1A



DGA planning | architecture | interiors

201 Filbert St., 3rd Floor
San Francisco, CA 94133

415.477.2700
f.415.477.2710

NEW VIVARIUM BEHAVIOR SUITE
6TH FLOOR

Drawing Title:

THE J. DAVID GLADSTONE INSTITUTES AT SAN FRANCISCO MISSION BAY
1650 OWENS STREET, SAN FRANCISCO CA

Project:

Job No:	06XXX
Date:	12 MAR 2007
Ref:	DRAFT
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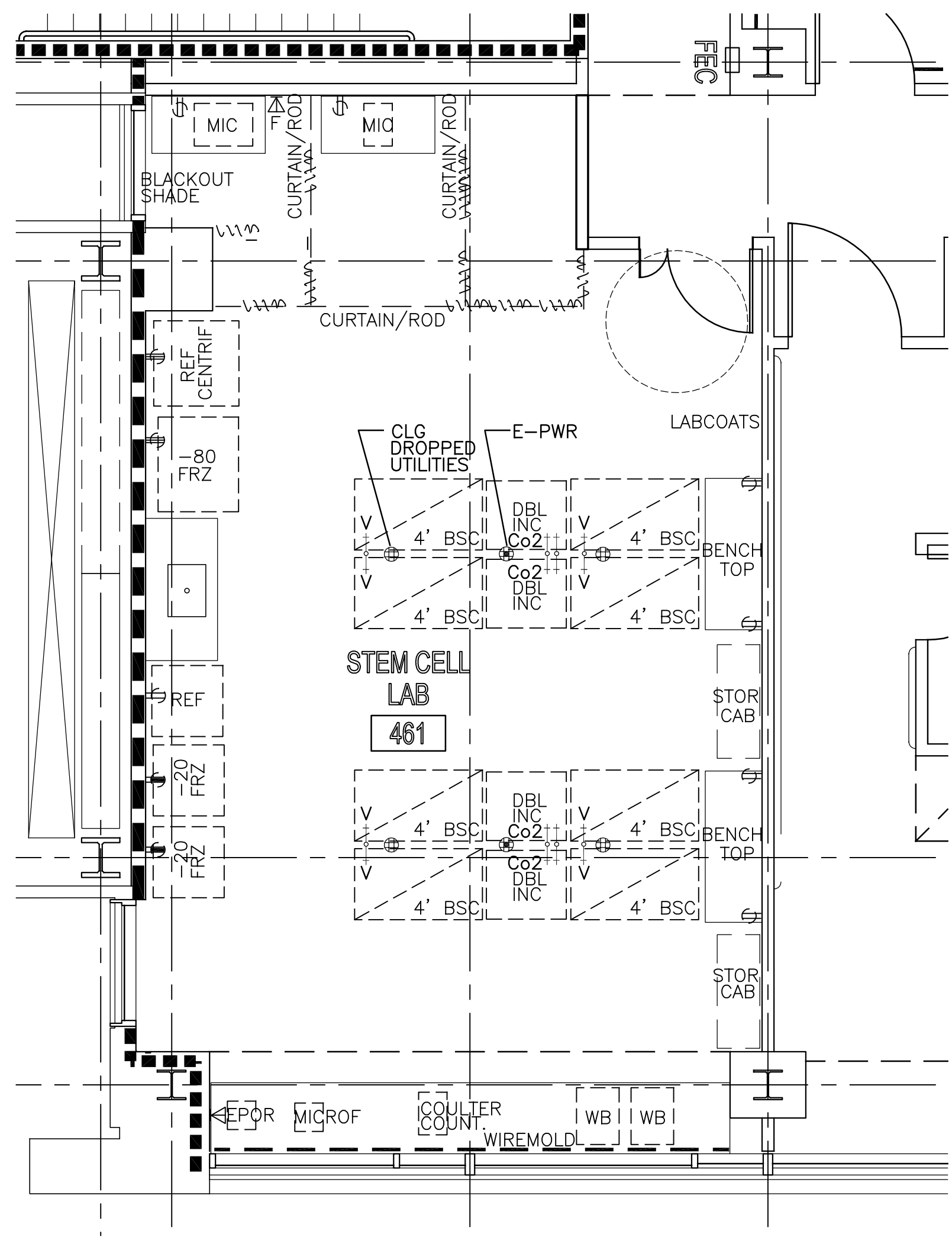
Dwg. No:	SK 1A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CLG DROPPED UTILITIES
E-PWR
LABCOATS
DBL INC Co2
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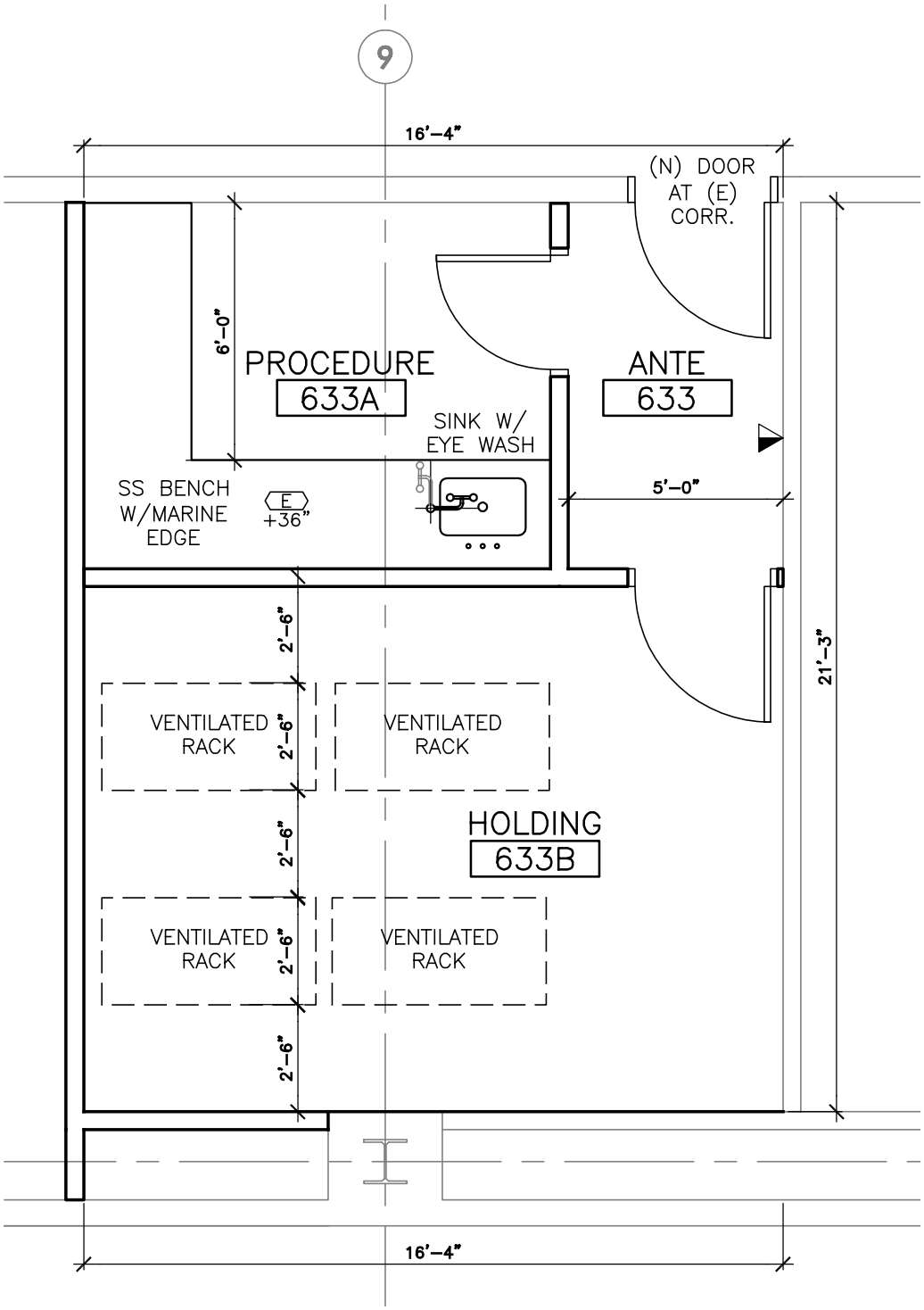
STOR CAB
STEM CELL LAB
461
EPOR
MICROF
COULTER COUNT.
WB
WB
WIREMOLD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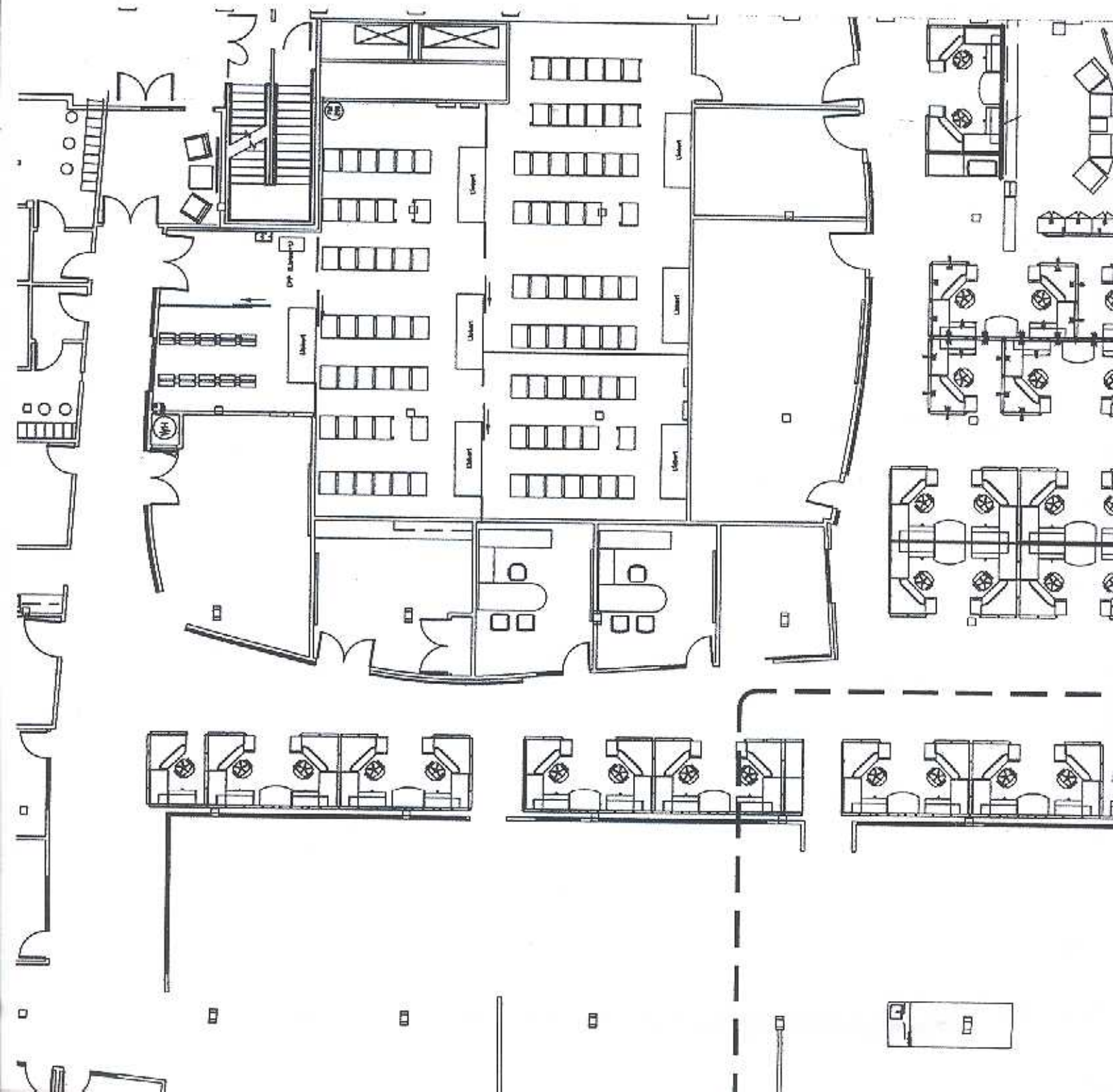
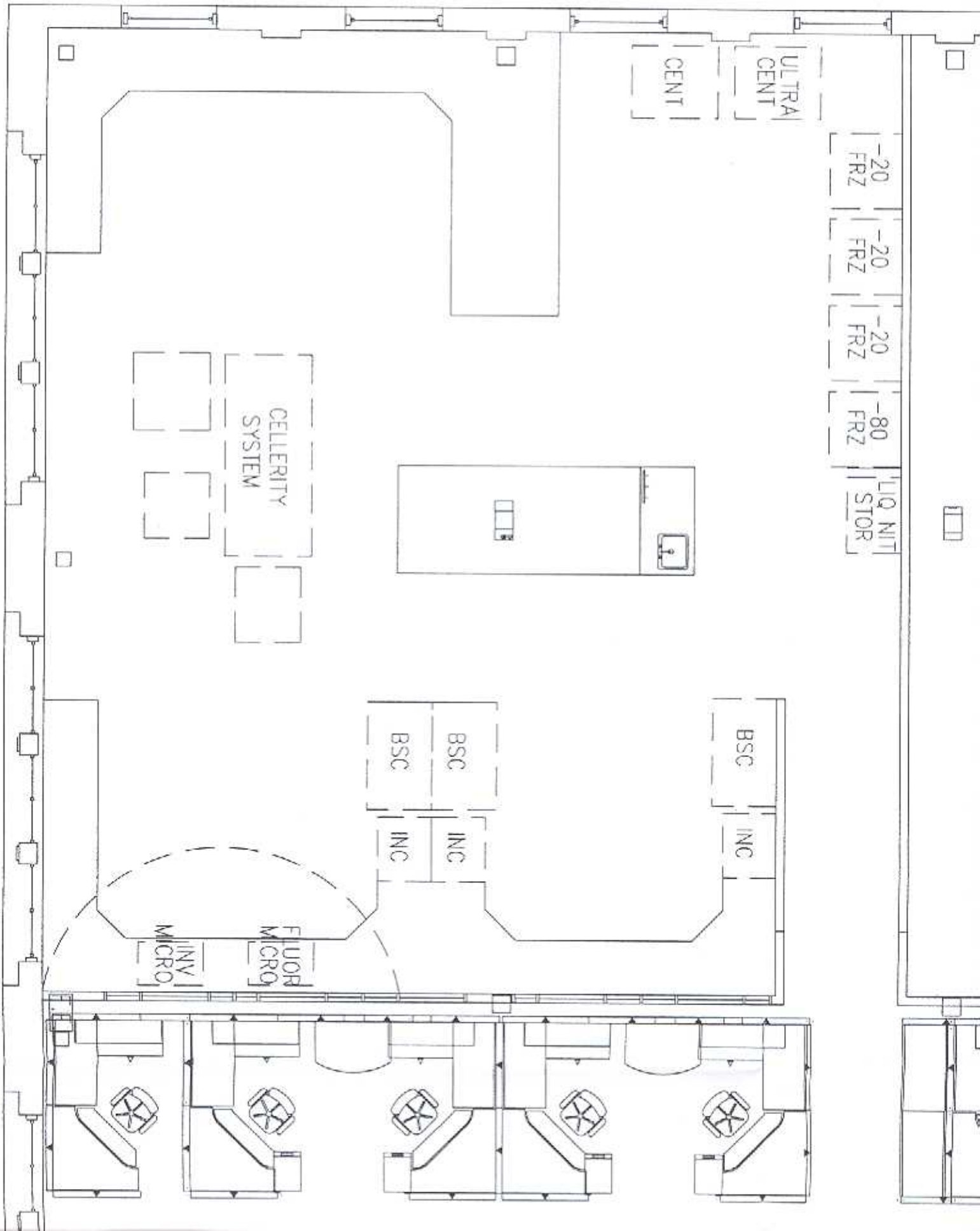
16'–4"
(N) DOOR
AT (E)
CORR.
6'–0"
PROCEDURE
633A
ANTE
633
SINK W/
EYE WASH
SS BENCH
W/MARINE
EDGE
E
+36"
5'–0"
2'–6"
VENTILATED
RACK
2'–6"
VENTILATED
RACK
HOLDING
633B
2'–6"
VENTILATED
RACK
2'–6"
VENTILATED
RACK
2'–6"
21'–3"
16'–4"

Current Floor Plan – Zone 4 at 475 Brannan



Proposed Floor Plan of Shared Laboratory (section of Zone 4)



Appendix A

Application: CL1-00514-1

Title: The Gladstone CIRM Shared Human Embryonic Stem Cell Core Laboratory

Public Abstract:

The CIRM Shared Human Embryonic Stem Cell Core Laboratory will provide shared research facilities for use by California scientists. This laboratory will be hosted by a research institution focused on basic research into three of the most important medical problems of modern times: cardiovascular disease, AIDS, and neurodegenerative disorders. Each of these research areas addresses promising targets for regenerative medicine. We propose to develop a laboratory (1108 sq ft) for hESC tissue culture with specialized microscopy, and an animal holding and procedure space (500 sq ft) for in vivo pre-clinical studies of hESCs in mouse models of disease. The proposed laboratory will also help to train students from a nearby college be become laboratory technicians. This facility will contain advanced equipment for analyses of hESCs and complement existing space and incorporate hESC work provided by other core laboratories such as the genomics and flow cytometry cores that serve a broad community of researchers.

The host institution is renowned for the quality and administration of its extensive core facilities. Highly productive cores have always been at the heart of this institution's culture and this continues to be a priority. Five years ago, the host institution founded an embryonic stem cell core, which allows investigators not familiar with ESC research to obtain training, expertise and knowledge regarding embryoid bodies and ESC differentiation. As a result, two-thirds of the current investigators have incorporated some aspect of stem cell research in their portfolio. The host institution is also located in close proximity to a major biomedical university, so that all stem cell services are being coordinated to provide the best possible array of services to all stem cell investigators.

The research interests of our investigators that are related to stem cells can be grouped into three areas: cardiovascular development and disease, neurodegeneration and repair, and mechanisms that control the genetic stability of the cells while they divide and develop. This research involves the creation of genetically altered ESCs that require maintenance, expansion, and characterization. To aid in the analysis of the cellular phenotypes, we propose to use advanced high-content microscopy equipment. Several leading laboratories that apply this technology to basic cell biological analysis are close to Gladstone. An important next step will be to examine the behavior, survival, and interactions of hESCs once they have been implanted into mice. Visualization of the cells in live animals will be greatly enhanced by the proposed imagining instrument that will allow us to examine living cells within animals by light signals transmitted from the implanted cells. This program represents a comprehensive basic approach to how stem cells develop into other kinds of cells and will form the foundation for future preclinical studies.

Statement of Benefit to California:

Contribution to the California Economy:
A major goal of regenerative medicine is to repair damaged tissue. Our research focuses on developing new methods to differentiate human embryonic stem cells (hESCs) into specific cell types for regeneration of diseased tissues. Our research could benefit the California economy by creating jobs in the biomedical industry by developing new technology. Ultimately, this study could help reduce diseases, including cardiovascular, immune, and neurological diseases. Thereby, we hope to increase the productivity and enhance the quality of life for Californians.

The results of our studies will help develop new technology that could contribute to the California biotechnology industry. Our studies will create multiple lines of hESCs that have genetic markers that turn on at specific time points. These cell lines could be valuable for biotechnology companies and researchers who are screening for drug compounds that will cause these developmental changes. Furthermore, we are working closely with California companies to develop new microscopes and analysis software that could be the basis for new product lines or new businesses. If therapies do come to fruition, we anticipate that California medical centers will be leading the way.

The most important contribution of this study will be to improve the health of Californians. Diseases that are the target of regenerative medicine are major causes of mortality and morbidity, resulting in billions of dollars in healthcare costs and lost days at work. As we continue our efforts in medical research, we hope to one day unlock the secrets of tissue development and repair. This knowledge will help medical researchers develop beneficial therapies beyond what is currently available and potentially improve the quality of life and life expectancy of patients who suffer from disease.